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Abstract

The effect of the electromagnetic field (EMF) established when cell phones are in use on human health, and particularly the head, has been the subject of major scientific research. Phones are usually carried near the lumbar region when not in use, and the kidneys will also inevitably be affected by such fields. We investigated the effects on the kidneys of female rats exposed to a continuous 900-megahertz (MHz) EMF for 1 h daily in mid-late adolescence. Control, sham, and EMF groups were established. The EMF was applied to the application group rats daily on postnatal days 35–59. A pseudo-megahertz effect was applied to sham group rats. All animals were euthanized on postnatal day 60. Right kidney tissues were subjected to routine procedures. Malondialdehyde, total antioxidant status, and total oxidant status (TOS) were investigated in left kidneys, and the oxidative stress index (OSI) was also calculated from these. Histopathological analysis revealed no pathology in either the control or sham groups. However, findings including hemorrhage in glomerulus, vacuolization and irregularity in the proximal and distal tubular epithelium, diffuse glomerular degeneration and edema, occasional degeneration in Bowman capsules, hemorrhage in the medullary region, disturbed nucleus location and morphology, and tubular edema in the cortex were observed in the EMF groups. TOS and OSI values were lower in the EMF group (9.4316 ± 1.0211 and 0.8461 ± 0.0826, respectively) and the sham group (8.2171 ± 0.6437 and 0.7358 ± 0.0545, respectively) than in the control group (11.1522 ± 1.3389 and 1.0085 ± 0.1174, respectively) ($p < 0.05$). In conclusion, exposure to a continuous 900-MHz EMF for 1 h daily during middle and late adolescence may cause various changes in the female rat kidney at postnatal day 60.

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